REMARKS/ARGUMENTS

Claims 1-24 and 26-50 were previously pending.

Independent Claims 1, 14, 24, 26, 49 and 50 have been amended to include subject matter related to previously pending claims 6, 8, 9, 11 and 12. Support for these amendments may be found in the description in the following locations: page 6 (lines 13 to page7 (line 7), p.7 (lines 13 to 33).

Claims 6, 8, 9, 11, 12, 21, 22, 33, 34, and 36 are cancelled.

Thus claims 1-5, 7, 10, 13-20, 23, 24, 26-32, 35, and 37-50 are now pending.

Claims 2, 15, 27, are amended to make more explicit that the low band of values includes the low watermark value of claims 1, 14 and 26 respectively.

Claim 7 is amended so that it depends on claim 1 due to the cancellation of claim 6.

Claims 10 and 35 are amended so that they depend on claim 1 and claim 26 respectively to take account of the cancellation of claims 9 and 34 respectively.

Claim 17 is amended so that it depends upon claim 15. This amendment is supported by claims 14 and 29.

Claim 19 is amended to make more explicit that the time-out value and the transmission timer of claim 19 are the time-out value and the transmission timer of claim 14 respectively.

Claim 24 is amended to make more explicit that the incoming data for transmission is divided into data frames. This amendment is supported by claim 24 (lines 6 and 7) in which the controller controls the passing of the data frames through the frame buffer.

Claim 32 is amended to make claim 32 depend on claim 26 due to the cancellation of claim 31, and to make it abundantly clear that the controller is arranged to calculate the transmit delay time of claim 26 upon which it now depends.

Claim 35 is amended so that it depends on claim 26, due to the cancellation of claim 34.

Claim 43 has been amended to make it abundantly clear that the controls are from the controller of claim 26.

Claims 45 to48 have been amended to change their dependencies due to the deletion of claims 11 and 36.

Applicant respectfully requests reconsideration of this application based on the following remarks.

Claim Rejections – 35 USC § 101

Claim 50 was rejected for being directed to non-statutory subject matter. Applicant has amended this claim according to the Examiner's suggestion. Therefore, Applicant respectfully request the Examiner to withdraw this rejection.

Claim Rejections – 35 USC § 102

Claims 1, 2, 5-11, 14, 15, 18-21, 24, 26, 27, and 39-42, 49 and 50 are rejected under 35 USC § 102(a) as being anticipated by Bauer (European Patent Publication No. EP 1133201 A1).

Claim 1 as amended now includes subject matter that relates to: receiving parameter data pertaining to a time-out value of a retransmission timer susceptible to delay and pertaining to the size of a largest data frame that may be output for transmission; calculating a transmit delay time using the time-out value; calculating a size of a largest frame to be transmitted from the size of the largest data frame that may be output for transmission; receiving radio link resources data including an allocated coding scheme and a number of allocated transmission slots for the buffered data frames to be transmitted; calculating a transmit rate from the allocated coding scheme and the number of allocated transmission slots; and determining the high watermark value using the calculated transmit delay time, the calculated size of the largest frame to be transmitted and the calculated transmit rate.

Applicant respectfully submits that, due to the addition of the above subject matter to claim 1, the objections of the Official Action under 35 USC § 102(a) regarding claim 1 and its dependent claims are rendered moot. Applicant respectfully submits that all of the remainder of the objections of the Official Action under 35 USC § 102(a) are rendered moot because independent claims 14, 24, 26, 49 and 50 recite similar subject matter to the subject matter of amended claim 1.

Applicant respectfully submits that Bauer, Rajaraman and Pecen each do not disclose or suggest the subject matter (detailed above) of the amended independent claims and therefore the amended independent claims now satisfy the requirements of 35 USC § 102(a).

Claim Rejections – 35 USC § 103

Claims 3, 4, 12, 13, 16, 17, 22, 23, 28, 29, 37, 38, 43 and 44 are rejected under 35 USC § 103(a) as being unpatentable over Bauer in view of Rajaraman (US Patent No. 5,802,310). Claims 45 to 48 are rejected under 35 USC § 103(a) as being unpatentable over Bauer in view of Pecen et al (Patent No. 7,181,223). Since all of the independent claims have been amended as described above, Applicant submits that the objections of the Official Action to claims 3, 4, 12, 13, 16, 17, 22, 23, 28, 29, 37, 38, 43 and 44 under 35 USC § 103(a) are rendered moot by the amendments above. Applicant now provides arguments which should make it clear that Rajaraman is the most relevant of the cited documents and that the newly amended independent claims are patentable according to 35 USC § 103 over Rajaraman in view of Pecan and Bauer.

Pecan describes a communication system including apparatus for controlling the sending of data by sending and receiving uplink radio link control data blocks, downlink radio link control data blocks, an identifier and an uplink state flag indicating channel availability. The common elements between the claimed subject matter and Pecen are the transmitting and receiving of data. The communication system of Pecan is therefore only relevant to the subject matter of the independent claims in that data is sent and received.

The amended independent claims relate to transmitting of data by using buffering, a high watermark value and a low watermark value, none of which are described in Pecan. Therefore Pecen is not considered as relevant to the amended claims by Applicant and will not be considered further.

Bauer is concerned with controlling a flow rate of data from a serving node to a packet control unit. This is achieved by forming a queue of data in the packet control unit, the queue having upper and lower 'triggers', and maintaining an amount of data in the queue between the upper and lower triggers by altering a rate at which data is leaked from the serving node to the packet control unit. (See Bauer, Fig.2, abstract and paragraph 0018.)

Rajaraman describes a system in which data is sent via a channel from a source application running at a source node to a destination application running at a destination node. Data is sent from the source application to a queue and then data is sent from the queue to the channel. The transfer from the source application to the queue is disabled when the amount of queued data in the queue is greater than a first limit (high water mark) and enabled when the amount of queued data in the queue is less than a second limit (low water mark). The system

thus maintains the amount of data in the queue between the first and second limits by discontinuing or continuing the transfer of data from the application to the queue. (See Rajaraman, Fig.3, Fig.5, column 3, lines 30 to 36, and column 4, lines 13 to 21.

Claim 1 of the present application provides an apparatus which determines a high watermark value and a low watermark value. The high and low watermark values correspond to maximal and minimal numbers of data frames to be buffered in a buffer and the watermarks serve to maintain the number of data frames in the buffering means between the high and low watermark values.

From the above it is apparent that Bauer, Rajaraman and claim 1 of the present application all relate to the task of transmitting data from one entity to another entity via a queue or buffer and maintaining an amount of stored data in the queue between an upper queue limit and a lower queue limit.

Rajaraman also describes dynamically and automatically adapting the upper queue limit and the lower queue limit based on the amount of data in the queue, the data flow rate of the data channel, the buffer storage capacity of the communications buffer which the queue occupies, and the state of the data transfer from the application to the queue (col.4, lines 15 to 20). The stated advantage of doing this is that the data channel capacity can be "efficiently utilized" (see the section of Rajaraman entitled "SUMMARY OF THE INVENTION", first paragraph). This assertion is not explained in any further detail. The problem solved by Rajaraman would thus appear to be providing a means for efficiently utilizing data channel capacity.

However a problem exists which is not solved by Bauer or Rajaraman. The problem is that there are a number of conflicting considerations that need to be taken into account in order to adapt the typically high data rate of a data sourcing application to a typically lower data rate of a communication channel (see the description of the present application, page 5, lines 5, 6, 11, 12). Neither Bauer nor Rajaraman mention these conflicting considerations which are summarized below (see the description, page 5, lines 10 to 34):

Firstly it is desirable for the transmit process to be able to "see" at least two frames for transmission at any given time. This requirement can be met by increasing the size of the buffer.

Secondly the transmit delay will be made worse by excess buffering in the path, so the need here is to reduce the size of the buffer.

Thirdly excessive delay in the buffer could cause premature expiry of a retransmission timer resulting in retransmission that would otherwise have been unnecessary and reduces the throughput of data. This also suggests <u>reducing</u> the size of the buffer.

The features of claim 1 address these conflicting considerations and thereby provide the combined advantages of (a) allowing watermark values to be chosen that provide sufficient data to satisfy the needs of the protocol layer taking receipt, e.g. the RLC layer, and at the same time (b) minimizing the buffer's contribution to transmit delay as presented to the preceding protocol layers, e.g. the LLC layer (see the description, page 6, second paragraph). The features of claim 1 achieve these combined advantages by providing (Claim 1):

> an apparatus for transmitting data, the apparatus comprising:
>> segmenting means for segmenting data into data frames;
>> buffering means for buffering the data frames from the segmenting means;
>> transmitting means, connected to the buffering means to receive buffered data frames therefrom, for transmitting the data frames; and
>> controlling means for controlling the segmenting means, the controlling means being arranged to receive parameter data from the segmenting means pertaining to the segmented data frames and radio link resources data from the transmitting means pertaining to the transmission of data frames, to calculate a high watermark value and a low watermark value in response to the received parameter data and radio link resources data corresponding to maximal and minimal numbers of data frames to be buffered in the buffering means, and to control the segmenting means to maintain the number of data frames in the buffering means between the high and low watermark values, in which apparatus the controlling means is arranged to:
>>> receive from the segmenting means parameter data pertaining to a time-out value of a retransmission timer susceptible to delay and pertaining to the size of a largest data frame that may be passed to the transmitting means for transmission;
>>> calculate a transmit delay time using the time-out value;

calculate a size of a largest frame to be transmitted from the size of the largest data frame that may be passed to the transmitting means for transmission;

receive from the transmitting means radio link resources data including an allocated coding scheme and a number of allocated transmission slots for the buffered data frames to be transmitted;

calculate a transmit rate from the allocated coding scheme and the number of allocated transmission slots; and

determine the high watermark value using the calculated transmit delay time, the calculated size of the largest frame to be transmitted and the calculated transmit rate.

The skilled person seeking to provide a means for addressing the conflicting considerations that need to be taken into account, in order to adapt the typically high data rate of a data sourcing application to a typically lower data rate of a communication channel, would be most likely to consult Rajaraman because Rajaraman describes dynamically and automatically adapting an upper queue limit and a lower queue limit. However, Rajaraman only describes dynamically and automatically adapting the upper and lower queue limits based on the amount of data in the queue, the data flow rate of the data channel, the buffer storage capacity of the communications buffer which the queue occupies, and the state of the data transfer from the application to the queue (see the section of Rajaraman entitled "SUMMARY OF THE INVENTION", first paragraph).

Rajaraman does not mention or suggest calculating a transmit rate from an allocated coding scheme and a number of allocated transmission slots. Also Rajaraman does not mention or suggest using a calculated transmit delay time or using a calculated size of a largest frame to be transmitted. Also Rajaraman does not mention or suggest determining a high watermark value using the calculated transmit delay time, the calculated size of the largest frame to be transmitted and the calculated transmit rate. The skilled person, having failed to find these features in Rajaraman, would not find the features in either Bauer or Pecen. He would therefore not arrive at the claimed features of claim 1 by combining the teachings of Bauer, Rajaraman and Pecen. He would not therefore be able to achieve the advantage of obtaining watermark values that (a) provide sufficient data to satisfy the needs of the protocol layer taking receipt, e.g. the